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COMMENTARY

Prevention of opportunistic non-communicable diseases

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As strategies targeting undernutrition and infections become increasingly successful in low- and middle-income countries (LMICs), a second challenge has appeared, namely premature onset of non-communicable diseases (NCDs). In LMICs, NCDs are often related to exposure to undernutrition and infections. As NCDs strike societies and individuals with impaired resistance or a deficient health (care) state, why not label such diseases 'opportunistic', in analogy with opportunistic infections attacking individuals with HIV? We propose the concept of opportunistic NCDs, hoping that fighting against infections, and for better maternal and child health, is becoming acknowledged as essential for the early prevention of NCDs.

Keywords: infections, non-communicable diseases, sub-Saharan Africa, undernutrition

As treatment strategies targeting undernutrition and infections become increasingly successful in low- and middle-income countries (LMICs), individuals survive to meet a second challenge, namely the premature onset of non-communicable diseases (NCDs).

NCDs cover many entities such as cancers, respiratory diseases, type 2 diabetes, chronic kidney disease and cardiovascular diseases. NCDs are the leading cause of death worldwide, which is an expected consequence when health transitions cause individuals to evade or survive undernutrition and infections. Compared with high-income countries, the NCD burden in LMICs is disproportionately high and often related to exposure to undernutrition and infections.[1]

As NCDs strike societies and individuals with impaired resistance or a deficient health (care) state, why not label such diseases 'opportunistic', in analogy with opportunistic infections attacking individuals with HIV? Opportunistic infections are defined as infections that occur more frequently among individuals with weakened immune systems.[2]

The increasing burden of NCDs we observe in sub-Saharan Africa and other countries in fast transition frequently affects vulnerable individuals exposed to risk factors at different stages in life. Materno-fetal risk factors such as maternal undernutrition, anemia or infections such as malaria or HIV may result in low birthweight,[3] whereas gestational diabetes may result in high birthweight.[4] Newborns exposed to maternal undernutrition may be at increased risk of developing type 2-like diabetes through decreased insulin secretion and decreased insulin sensitivity.[5] These babies are programmed to survive in poor nutritional conditions, making them more vulnerable towards affluence, even if their lifestyle and apparent phenotype (e.g. normal body mass index [BMI]) are not particularly unhealthy by western standards. Newborns with high birthweight caused by exposure to gestational diabetes are at increased risk of childhood obesity and development of metabolic syndrome and type 2 diabetes.[6] Thus, low birthweight is as risky as high birthweight for NCDs.[3] In childhood, exposure to enteric infections, malnutrition and restricted growth may increase the risk of future cardiovascular diseases,[7] as in the case of childhood obesity. In adults, several infections are linked to NCDs. Diabetes is linked with TB,[8] and cardiometabolic complications and non-alcoholic fatty liver disease are linked with HIV.[9] Improved survival and some antiretrovirals add to the burden of opportunistic NCDs among HIV-infected individuals. Renaming these NCDs opportunistic underscores that they are not only related to a sedentary lifestyle, being overweight, and alcohol and tobacco abuse. Furthermore, NCDs in LMICs are challenging to recognize, as hypertension and type 2 diabetes often develop under normal nutritional conditions and normal BMI.[10]

Globally, 40% of the deaths from NCDs are premature, of which >75% occur in LMICs.[1] With a focus on the recognized four shared risk factors for NCDs—namely tobacco use, physical inactivity, an unhealthy diet and harmful use of alcohol—in 2013, the WHO launched the Global NCD Action Plan to reduce the burden of NCDs.[1] We suggest that opportunistic NCDs are linked to undernutrition and infections, and that stress, including pregnancy, is potentiated by unhealthy exposure to tobacco, inactivity, poor diet and alcohol. The combination of this double burden of exposures

and poor access to health systems could explain the earlier debut of and death from NCDs in LMICs compared with high-income countries.

The burden of NCDs is an international top priority, and the recent issue of *The Lancet*[11] on the financing of NCDs calls for increased action against NCDs, and claims that the WHO Universal Health Coverage initiative, together with the focus on ebola and the Millennium Development Goals, have sidelined efforts to introduce new vertical initiatives, i.e. against NCDs.

Financing NCD care is a huge challenge in LMICs where domestic financing is very limited and health services are mainly financed through out-of-pocket payments.[12] Many LMICs depend on international aid to provide healthcare services. However, there is a huge disparity between the NCD burden and international health aid.[12]

Many countries still underprioritize NCD care in their health budgets,[11] despite warnings from researchers against the double burden of disease and the fact that NCDs have been a major cause of death for several decades. We need to rethink our strategies, to avoid the battle against communicable diseases and NCDs becoming a fight for funds to control either health problem, rather than a fight against the double burden of disease.[13] We propose the concept of opportunistic NCDs, hoping that fighting against infections and for better maternal and child health is becoming acknowledged as essential for the early prevention of NCDs, and not a competitor for sparse resources.

We need to be as opportunistic as the problems we are fighting.

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References

1 World Health Organization. Global action plan for the prevention and control of noncommunicable diseases 2013–2020. World Health Organization, Geneva, Switzerland, 2013.

2 Centers for Disease Control and Prevention. AIDS and Opportunistic Infections. https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html [accessed 26 January 2019].

3 Sharma M, Mishra S. Maternal risk factors and consequences of low birth weight in Infants. Int J Human Soc Sci. 2013;13:39–45.

4 Sudasinghe BH, Wijeyaratne CN, Ginige PS. Long and short-term outcomes of Gestational Diabetes Mellitus (GDM) among South Asian women—a community-based study. Diabetes Res Clin Pract. 2018; 145:93–101.

5 Thorn SR, Rozance PJ, Brown LD, et al. The intrauterine growth restriction phenotype: fetal adaptations and potential implications for later life insulin resistance and diabetes. Semin Reprod Med 2011;29:225–36.

6 Armengaud, JB, Ma RCW, Siddek B, et al. Offspring of mothers with hyperglycaemia in pregnancy: the short term and long-term impact. What is new? Diabetes Res Clin Pract. 2018;145:155–66.

7 DeBoer MD, Lima AA, Oria RB, et al. Early childhood growth failure and the developmental origins of adult disease: do enteric infections and malnutrition increase risk for the metabolic syndrome? Nutr Rev. 2012;70:642–53.

8 Harries AD, Kumar AMV, Satyanarayana S, et al. Communicable and non-communicable diseases: connections, synergies and benefits of integrating care. Public Health Action. 2015;5:156–7.

9 Ahmed MH, Husain NE, Malik A, et al. Non-alcoholic fatty liver disease and HIV/AIDS: a new way of modulation of cardiovascular risk. AIDS Rev 2017;19:190–7.

10 Desai M, ter Kuile FO, Nosten F, et al. Epidemiology and burden of malaria in pregnancy. Lancet Infect Dis 2007;7:93–104.

11 Horton R, Sargent J. 2018 must be the year for action against NCDs. Lancet. 2018;391:1971–73.

12 Ortiz-Ospina E, Roser M. Financing Health Care. Our world in data, 2018. http://ourworldindata.org/financing-healthcare [accessed 19 April 2018].

13 Bygbjerg IC. Double burden of noncommunicable and infectious diseases in developing countries. Science. 2012;337:1499–501.